



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/783,542	02/20/2004	Hanspeter Pfister	MERL-1538	7438
22199 7590 06/03/2008 MITSUBISHI ELECTRIC RESEARCH LABORATORIES, INC. 201 BROADWAY 8TH FLOOR CAMBRIDGE, MA 02139			EXAMINER ANYIKIRE, CHIKAODILI E	
			ART UNIT 2621	PAPER NUMBER
			MAIL DATE 06/03/2008	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

DETAILED ACTION

1. This application is responsive to application number (10783542) filed on October 15, 2007. Claims 1-29 are pending and have been examined.

Response to Arguments

2. Applicant's arguments filed March 06, 2008 have been fully considered but they are not persuasive. Claims 1-29 are currently pending and have been examined.

3. The applicant that the prior art of record does not teach, "a video in and a video out" (Amendment of 3/06/2008: pg 9 Ln 1-10). The examiner respectfully disagrees. The examiner points to the applicants model of Ritchey argues that the first block is input videos and the last blocks shows output video, therefore the examiner by applicant's model description believes that the claim is met.

4. The applicant argues that the prior art of record does not teach, " a plurality of cameras to acquire calibration images displayed on the display surface of the three-dimensional display unit to determine the viewing parameters" (Amendment of 3/06/2008; pg 9 Ln 32- pg 10 Ln 1). The examiner respectfully disagrees and refers to Col 11 Ln 61-63; which the disclosure states a plurality of cameras (Fig 6a-6f) produce a plurality of images that are compressed into a single frame by processing means, which shows that there is a calibration happening between the plurality of cameras.

5. The applicant argues that it is unclear which prior art the Examiner is referencing (Amendment of 03/06/2008; pg 10 Ln 18-19). The examiner respectfully disagrees and states that the Office Action states Ritchey as disclosing the claim and also refers to sections of the disclosure. The applicant argues that the rejections of claims 22-24 are

omnibus rejection. The examiner believes that the claims are addressed as distinct and points the inherency within each claim.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1-3, 5-24 and 27 are rejected under 35 U.S.C. 102(b) as being anticipated by Ritchey (US 5,495,576).

As per **claim 1**, Ritchey discloses a three-dimensional television system, comprising:

an acquisition stage, comprising:

a plurality of video cameras (Fig 17, 6a-6f), each video camera configured to acquire a video of a dynamically changing scene in real-time (Col 10 Ln 1-9 and Col 26 Ln 62-66); means for synchronizing the plurality of video cameras (Col 11 Ln 49-54); and

a plurality of producer modules (Fig 17, 15a-15f) connected to the plurality of video cameras (Col 26 Ln 9-19), the producers modules configured to compress the videos to compressed videos and to determine viewing parameters of the plurality of video cameras (Fig 17, 6a-6f; Col 26 Ln 4-9);

a display stage, comprising:

a plurality of decoder modules (Fig 17, 72a-f) configured to decompress the compressed videos to uncompressed videos (Col 21 Ln 49-52);

a plurality of consumer modules (Fig 17, 72a-f) configured to generate a plurality of output videos from the decompressed videos (Col 21 Ln 49-52);

a controller (Fig 17, 9) configured to broadcast the viewing parameters to the plurality of decoder modules and the plurality of consumer modules (Col 21 Ln 47-49 and 59-67; the controller takes the video signals and information that correspond to view parameters);

a three-dimensional display unit (Fig 17, 12) configured to concurrently display the output videos according to the viewing parameters (Col 22 Ln 45-47); and

means of connecting (Fig 17, 80a-80f) the plurality of decoder modules (Fig 17, 72a-f), the plurality of consumer modules (Fig 17, 72a-f), and the plurality of display units (Fig 17, 70-70f); and

a transmission stage,

connecting the acquisition stage to the display stage, configured to transport the plurality of compressed videos and the viewing parameters (Col 32 Ln 23-33).

As per **claim 2**, Ritchey discloses the system of claim 1, further comprising a plurality of cameras to acquire calibration images (Col 11 Ln 61-63 and Col 12 Ln 3-9) displayed on the three-dimensional display unit to determine the viewing parameters (Col 20 Ln 46-56).

As per **claim 3**, Ritchey discloses the system of claim 1, in which the display units are projectors (Col 30 Ln 4-10).

As per **claim 5**, Ritchey discloses the system of claim 1, in which the three-dimensional display unit uses front-projection (Col 31 Ln 67 – Col 32 Ln 2).

As per **claim 6**, Ritchey discloses the system of claim 1, in which the three-dimensional display unit uses rear-projection (Col 35 Ln 3-7).

As per **claim 7**, Ritchey discloses the system of claim 1, in which the display unit uses two-dimensional display element (Col 35 Ln 3-7).

As per **claim 8**, Ritchey discloses the system of claim 1, in which the display unit is flexible, and further comprising passive display elements (Col 35 Ln 3-10).

As per **claim 9**, Ritchey discloses the system of claim 1, in which the display unit is flexible, and further comprising active display elements (Col 35 Ln 11-16).

As per **claim 10**, Ritchey discloses the system of claim 1, in which different output images are displayed depending on a viewing direction of a viewer (Col 22 Ln 58-67 and Col 28 Ln 31-37).

As per **claim 11**, Ritchey discloses the system of claim 1, in which static view-dependent images of an environment are displayed such that a display surface disappears (Col 30 Ln 38-51).

As per **claim 12**, Ritchey discloses the system of claim 1, in which dynamic view-dependent images of an environment are displayed such that a display surface disappears (Col 30 Ln 38-51).

As per **claim 13**, Ritchey discloses the system of claim 11 or 12, in which the view-dependent images of the environment are acquired by a plurality of cameras (Col 10 Ln 1-9 and Col 26 Ln 62-66).

As per **claim 14**, Ritchey discloses the system of claim 1, in which each producer module (Fig 17, 15a) is connected to a subset of the plurality of video cameras (Fig 17, 6a; Col 26 Ln 9-19).

As per **claim 15**, Ritchey discloses the system of claim 1, in which the plurality of video cameras (Fig 17, 6a-6f) are in a regularly spaced linear and horizontal array (Col 10 Ln 32-34 and Col 11 Ln 66-67).

As per **claim 16**, Ritchey discloses the system of claim 1, in which the plurality of video cameras (Fig 17, 6a-6f) are arranged arbitrarily (Col 10 Ln 38-41 and Col 11 Ln 66-67).

As per **claim 17**, Ritchey discloses the system of claim 1, in which an optical axis of each video camera is perpendicular to a common plane, and the up vectors of the plurality of video cameras are vertically aligned (Col 12 Ln 44-47).

As per **claim 18**, Ritchey discloses the system of claim 1, in which the viewing parameters include intrinsic and extrinsic parameters of the video cameras (Col 11 Ln 55-63 and Col 12 Ln 3-11).

As per **claim 19**, Ritchey discloses the system of claim 1, further comprising: means for selecting a subset of the plurality of cameras for acquiring a subset of videos (Col 20 Ln 46-50).

As per **claim 20**, Ritchey discloses the system of claim 1, in which each video is compressed individually and temporally (Col 26 Ln 4-25).

As per **claim 21**, Ritchey discloses the system of claim 1, in which the viewing parameters include a position, orientation, field-of-view, and focal plane, of each video camera (Col 10 Ln 9-16, Col 11 Ln 55-61, and Col 12 Ln 1-9).

As per **claim 22**, Ritchey discloses the system of claim 1, in which the controller determines, for each output pixel $o(u, v)$ in the output video, a view number v and a position of each source pixel $s(v, x, y)$ in the decompressed videos that contributes to the output pixel in the output video (Col 15 Ln 7-15 and Col 17 Ln 4-30; the prior art addresses input values using a look-up table, which consist of weights, to find output pixel values).

As per **claim 23**, refer to the rejection of claim 22 and also the output pixel values are fundamentally a linear combination of source (input) pixel values.

As per **claim 24**, Ritchey discloses the system of claim 22, in which a block of the source pixels contribute to each output pixel (Col 15 Ln 7-15 and Col 17 Ln 4-30; the prior art discloses frames, which are blocks of pixels).

As per **claim 27**, Ritchey discloses the system of claim 1, in which an arrangement of the cameras (Fig 17, 6a-6f) and an arrangement of the display units (Fig 17, 70a-70f), with respect to the display unit, are substantially identical (Col 21 Ln 33-37).

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

10. Claims 4 rejected under 35 U.S.C. 103(a) as being unpatentable over Ritchey (US 5,495,576).

As per **claim 4**, Ritchey discloses the system of claim 1.

However, Ritchey does not teach in which the display units are organic light emitting diodes.

In the same field of endeavor, organic light emitting diodes are well-known and would have been obvious to use as a display unit as stated by the applicant in background of the instant application. The examiner takes official notice.

11. Claims 25 and 26 rejected under 35 U.S.C. 103(a) as being unpatentable over Ritchey (US 5,495,576) in view of Ezzra et al (US 5,703,717).

As per **claim 25**, Ritchey discloses the system of claim 1.

However, Ritchey does not explicitly teach in which the three-dimensional display unit includes a display-side lenticular sheet, a viewer-side lenticular sheet, a diffuser, and substrate between each lenticular sheets and the diffuser.

In the same field of endeavor, in which the three-dimensional display unit includes a display-side lenticular sheet (Fig 4, 34), a viewer-side lenticular sheet (Fig 4, 36), a diffuser (Fig 3, 35), and substrate between each lenticular sheets and the diffuser (Col 4 Ln 11-31; the prior art discloses that the lenticular screens have substrates on them to bond to the diffuser).

Therefore, it would have been obvious at the time of the invention to modify the invention of Ritchey with that of Ezzra. The advantage would have been to increase that separation of the 2D views at the observer and a reasonable angular spread is obtained (Col 4 Ln 26-30).

As per **claim 26**, Ritchey discloses the system of claim 1.

However, Ritchey does not explicitly teach in which the three-dimensional display unit includes a display-side lenticular sheet, a reflector, and a substrate between the lenticular sheets and the reflector.

In the same field of endeavor, Ezzra et al teach in which the three-dimensional display unit includes a display-side lenticular sheet (Fig 4, 34), a reflector (Fig 4, 35; diffusion plate can act as a reflector), and a substrate between the lenticular sheets and the reflector (Col 4 Ln 11-31; the prior art discloses that the lenticular screens have substrates on them to bond to the diffuser).

Therefore, it would have been obvious at the time of the invention to modify the invention of Ritchey with that of Ezzra. The advantage would have been to increase that separation of the 2D views at the observer and a reasonable angular spread is obtained (Col 4 Ln 26-30).

12. Claims 28 and 29 rejected under 35 U.S.C. 103(a) as being unpatentable over Ritchey (US 5,495,576) in view of Nayar et al (US 2004/0070565).

As per claim 28, Ritchey discloses the system of claim 1, in which the plurality of cameras (Fig 17, 6a-6f; Col 10 Ln 1-9 and Col 26 Ln 62-66).

However, Ritchey does not teach in which the plurality of cameras acquire high-dynamic range videos.

In the same field of endeavor, Nayar et al teach in which the plurality of cameras (Fig 24, 502) acquire high-dynamic range videos (paragraph [0124]).

Therefore, it would have obvious for one having ordinary skill in the art at the of the invention to modify Ritchey with Nayar et al. It is advantageous to use Nayar et al to overcome resolution limitations (paragraph [0124] Ln 8-11).

As per claim 29, Ritchey discloses the system of claim 1.

However, Ritchey does not teach in which the display units display high-dynamic range images of the output videos.

In the same field of endeavor, Nayar et al teach in which the display units (Fig 32, 506) display high-dynamic range images of the output videos (paragraph [0124])

and [128]; the reference discloses high-dynamic range video for a camera and the display would have to be high-dynamic also to display the images from the camera).

Therefore, it would have obvious for one having ordinary skill in the art at the of the invention to modify Ritchey with Nayar et al. It is advantageous to use Nayar et al to overcome resolution limitations (paragraph [0124] Ln 8-11).

Conclusion

13. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHIKAODILI E. ANYIKIRE whose telephone number is (571)270-1445. The examiner can normally be reached on Monday to Friday, 7:30 am to 5 pm, EST.

Application/Control Number:
10/783,542
Art Unit: 2621

Page 12

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marsha D. Banks-Harold can be reached on (571) 272 - 7905. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/CEA/
/Andy S. Rao/
Primary Examiner, Art Unit 2621
May 28, 2008